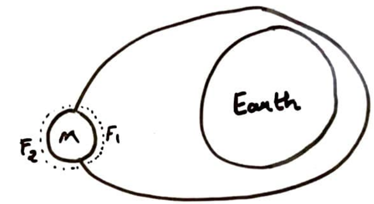
Wireless Power Transmission

⇒ Geosynchronous Orbit Calculation:

- F_1 persists for the complete Moon Orbital Time Period $T_M = 27.322$ days

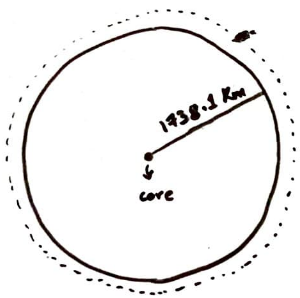
Hence Rotation $r_o = T_m$ [Due to earth gravitation the F_1 is tidally locked]



F_1 = near View

F_2 = Far View.

* Gravitational force $g_m = 1.62\ m/s^2$; * Mass $M_m = 7.35 \times 10^{22}$ Kg



Radius $R_m = 1{,}738.1$ Km [Equitorial Radius]

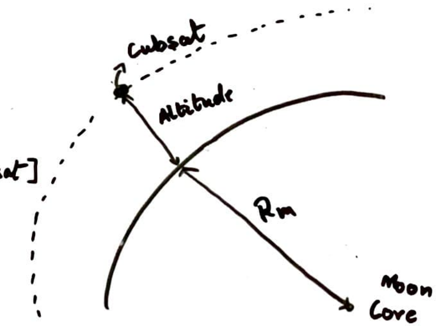
Rotational Time Period ⇒ r_{om} = 27.3 days. = 655.2 hours

Semi-Major Axis ⇒ $a_m = 3.844 \times 10^8$ m

Universal Gravitational Constant = $G = 6.67 \times 10^{-11}\ N \cdot m^2/Kg^2$

F_1 ⇒ Visible face for total time period T_M

F_1 ⇏ ∞ face visibility.



$F_g = ma_c \Rightarrow [a_c = r\omega^2] \Rightarrow F_g = mr\omega^2$ [ω = Angular Velocity of Cubsat]

$$\Rightarrow \omega = \frac{\text{Change in Angular Position}}{\text{Change in Time}} = \frac{\Delta\theta}{\Delta t} = \frac{2\pi}{T_m} = \frac{2\pi}{655.2} \times \frac{1}{(3600)} = 2.663811435 \times 10^{-6}\ \text{rad/sec}$$

$$\therefore \frac{G M_m m_s}{r^2} = m_s r\,\omega^2 \Rightarrow r = \sqrt[3]{\frac{G M_m}{\omega^2}} = \sqrt[3]{\frac{6.67 \times 10^{-11} \times 7.35 \times 10^{22}}{2.663811435 \times 10^{-6}}} = 88403353.2\ \text{m} = 88403.3532\ \text{Km}$$

[m_s = Cubsat mass]

$$\text{Altitude} = r - R_m = 88403.3532 - 1738.1 = \underline{\underline{86{,}665.2532\ \text{Km}}}$$